

5 Illusory correlation and stereotype formation: making sense of group differences and cognitive biases

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Women are more romantic than men. Scientists are duller than artists. We often make such judgements about groups. Some of these judgements are based on folklore, others are based on observation or experience. When we do rely on observed data how good are we at detecting relationships between group membership and behaviour? Do we find it easy to detect differences between groups? Are our judgements biased? This chapter deals with these issues and focuses on the paradigm that has dominated research on the *formation* of stereotypic differences between groups over the last three decades: the *illusory correlation paradigm*. In this paradigm respondents are exposed to a series of behavioural instances each linked to an individual belonging to a specific group. The term *illusory correlation* refers to perceived associations between attributes and instances other than those contained in the data. In the present case it generally refers to the perception of a stereotypic association of certain features with a given group, typically when the available data is presumed to give little evidence for this (hence 'illusory').

Detecting relationships between events in the environment, between group membership and behaviour, is an essential ingredient of adaptive behaviour. The information derived from these relationships or covariations allow us to make sense of the world by explaining the past, controlling the present and predicting the future (Alloy & Tabachnik, 1984; Crocker, 1981). In these terms, detecting contingency is clearly important for our well-being and even our survival. Although it is well-known that people are able to detect relations between stimuli, they are certainly not perfect in this regard (e.g., Jennings, Amabile & Ross, 1990). For example, it is known that people find it difficult to detect non-contingency (Peterson, 1980) and see relationships where these do not exist. Part of our argument below is that they also see them where *researchers* think that they do not exist, but we are jumping ahead of ourselves. The central theme in this chapter concerns the perception of socially relevant stimuli,

as in the examples above. In this chapter we describe a research program focusing on the processes and conditions that influence the perceived covariation of social stimuli.

Research on illusory correlation

As described above, the term *illusory correlation* refers to the perception of covariation between two classes of stimuli that are uncorrelated, or less strongly correlated than perceived. Chapman (1967) originally introduced the term to describe the over-association of semantically related word-pairs or word-pairs of unusual length. Hamilton and Gifford (1976) applied the concept of illusory correlation to the perception of social groups. In their first study, they presented participants with desirable and undesirable behavioural instances from two groups, called Group A and Group B. Group A represented the majority and Group B the minority. These two groups exhibited the same ratio of desirable to undesirable behaviours according to the distribution depicted in Table 5.1.

In other words, there was no correlation between type of behaviour and group membership. Examples of desirable items are: 'a member of Group A offers to work overtime when work piles up', and 'a member of Group B sees the funny side of little things that happen'. Examples of undesirable items are: 'a member of Group A finds co-workers ignorant and unintelligent', and 'a member of Group B comments loudly on people's clothes at a party'.

Hamilton and Gifford demonstrated that the co-occurrence of the infrequent (undesirable) behaviours and the infrequent group (B) was overestimated. An example of a typical response pattern is given in parentheses in Table 5.1. This pattern reflects the characteristic illusory correlation effect, namely the attribution of a relatively high proportion of (infrequent) negative behaviours to Group B as compared to Group A, resulting in a relatively negative impression of this group. Hamilton and Gifford argued that this 'paired-distinctiveness' pattern occurs because the combination of statistically infrequent categories is particularly salient to the perceiver. These categories thus receive more attention, are more efficiently encoded, and, consequently, are more accessible in memory than nondistinctive categories (Tversky & Kahneman, 1973).

A number of studies have identified factors that can weaken or eliminate the distinctiveness-based illusory correlation effect such as the self-relevance of stimulus-attitudes (Spears, van der Pligt & Eiser, 1985) and ingroup bias (Schaller & Maass, 1989). Other research revealed that illusory correlation effects can occur without the statistical infrequency of a particular category (Berndsen, McGarty, van der Pligt & Spears,

Table 5.1. *Distribution of the stimuli in the standard illusory correlation task*

	Desirable behaviours	Undesirable behaviours
Group A	18 (19)	8 (7)
Group B	9 (8)	4 (5)

2001; McGarty, Haslam, Turner & Oakes, 1993; Spears, van der Pligt & Eiser, 1986). However, research findings indicate that the paired distinctiveness effect is a reliable phenomenon (see e.g., McConnell, Sherman & Hamilton, 1994a; Mullen & Johnson, 1990).

The paired-distinctiveness illusory correlation just described is based on *data* and has been used to explain the *formation* of stereotypes about minorities and/or infrequently encountered groups (Hamilton & Gifford, 1976). Illusory correlation that is based on *expectations or theories*, on the other hand may offer an explanation for the *maintenance* of stereotypes (although this effect is less relevant to the focus on stereotype formation in current volume). Stereotypes can be defined as shared beliefs about behaviours and/or personality traits displayed by a group of people (for general reviews see e.g., Leyens, Yzerbyt & Schadrone, 1994; Messick & Mackie, 1989; Oakes, Haslam & Turner, 1994). Within social psychology the dominant explanation for the origin and maintenance of stereotypic beliefs is that they result from information processing biases. This view is often based on the assumption that the information in our social environment is too complex for our processing capabilities, and stereotypes allow us to simplify this information (see e.g., Fiske & Taylor, 1984, 1991; Hamilton, 1981a). According to this view, stereotypes are erroneous generalizations based on distorted impressions of individuals in terms of group characteristics. Other researchers have taken the view that stereotypes are not necessarily erroneous but from the stereotyper's perspective may represent valid interpretations of the social properties of group members (Leyens, Yzerbyt & Schadrone, 1994; McGarty & de la Haye, 1997; Oakes et al., 1994; Spears & Haslam, 1997). If this is true, illusory correlations might not be completely 'illusory.' Indeed researchers in this tradition have argued that illusory correlations (and stereotypes generally) may represent inferences based on behaviour-reflecting attempts to make sense of the situation (McGarty & de la Haye, 1997; McGarty, this volume). In this chapter we develop the idea that illusory correlations are not merely distortions but also the product of imposing sense on the world (and in the experimental context). Before

we do this, we briefly review the prevailing explanations of the illusory correlation effect.

Illusory correlation: a product of data-based distortion or of sense-making processes?

In this section we present several models that explain the occurrence of illusory correlation. We begin by describing those models in which illusory correlation is considered to be a distortion produced by information processing biases. Next, we present the categorization approach, which advocates the view that illusory correlation results from a sense-making process.

Illusory correlation as data-based distortions

Enhanced memory The original explanation of the distinctiveness-based illusory correlation effect formulated by Hamilton and Gifford (1976) involves a bias towards distinctive stimuli because these stimuli attract the observer's attention. More recently, McConnell, Sherman and Hamilton (1994a) extended this explanation by proposing that illusory correlation does not depend on distinctiveness at the time of encoding but on distinctiveness at the time of judgement. Information can become distinctive when old information is reconsidered in the light of new information. Thus information that was not distinctive at the time of encoding (for example because the relative frequency of classes of information is not yet established) can still become distinctive at a later moment, affecting subsequent judgements. Both the original and extended explanation refer to enhanced memory for distinctive stimuli.

Information loss and memory processes In contrast to the distinctiveness explanation Fiedler (1991; see also Fiedler, Russer & Gramm, 1993) considers the illusory correlation phenomenon to be a consequence of 'information loss.' Fiedler has argued that the illusory correlation pattern can be explained by the tendency for each group to be seen more positively than negatively, being diluted by random processes of information loss that disproportionately affects the smaller/less frequent group (B). Because participants perceive more statements about Group A, the perceived positivity of this group is less susceptible to the effects of information loss. However, the positivity of Group B is relatively more difficult to detect given the smaller sample of instances. Another way of stating this is that regression effects (e.g., to a baseline assumption

that the group is neither positive nor negative) are stronger in small samples (Group B) than in large samples (Group A). This differential information loss could account for the typical illusory correlation pattern. Fiedler et al. (1993) used signal-detection analysis to show a lower sensitivity (i.e., impaired memory) for infrequent behaviours than for frequent behaviours.

This explanation is closely related to that of Smith (1991). He demonstrated by means of computer simulations that the repeated observations of positive and negative behaviours in two groups of different frequency should result in different memory traces that can explain the illusory correlation effect. Specifically, memory traces associated with the positivity of the majority Group A are more established (being more numerous in absolute terms) and thus more easily activated by a prompt than those of the minority Group B (see also Rothbart, 1981). Thus, differential accessibility, like differential loss of the information in memory, can account for the illusory correlation effect.

Despite these different explanations for the illusory correlation effect, the approaches of Hamilton, McConnell, Fiedler and Smith all have in common the fact that they consider the illusory correlation effect to be a consequence of stimulus- or data-based distortions. Although these accounts differ about whether infrequent information is processed better or worse than other classes of information, they all support the view that illusory correlation is based on skewed distributions and reflects the differential processing of infrequent information. In sum, infrequent stimuli are assumed to lead to biased memory processes involving either selective attention (Hamilton, McConnell) and selective access to information (Smith), or selective loss (Fiedler) of information in memory. We present an alternative theoretical view next. Meanwhile it is worth noting that doubts about the viability of these memory-based accounts have emerged in recent evidence using a source monitoring analysis to separate component processes. This shows that the effects reflect processes involved in 'response bias' rather than memory processes (Klauer & Meiser, 2000; Klauer, Ehrenberg & Cataldegirmen, 2001; see also Spears, this volume). This finding is in line with our preferred approach in which the data-based distortions and memory processes are not necessary to explain the formation of 'illusory correlations.' We now outline this approach.

Illusory correlation as a sense-making process

Research by McGarty et al. (1993) has shown that the perception of infrequent stimuli is not necessary to obtain illusory correlations. They

argued that illusory correlation could result from attempts to differentiate meaningfully between groups. Their explanation is grounded in self-categorization theory (Turner, Hogg, Oakes, Reicher & Wetherell, 1987; see also McGarty, 1999, this volume) which in turn is rooted in Tajfel's work on social categorization and accentuation processes (e.g., Tajfel, 1969, 1981b). According to these accounts, categories are formed on the basis of the perception of similarities among, and differences between stimuli, and the categorization process therefore reflects an attempt to determine the basis of similarities/differences and to focus attention on them. Consequently, categorization results in the tendency to enhance the differences between distinct categories on a certain dimension and to minimize the differences within each of the categories. In order to accentuate differences between Group A and B, it is therefore clearly necessary to perceive differences between them.

With this in mind McGarty et al. stressed the importance of certain characteristics of the original task of Hamilton and Gifford (1976, Study 1). The most important characteristic in their view is that there is actually more evidence (in absolute terms) for the hypothesis that Group A is 'good' and Group B is 'bad' (18 + 4 stimuli) than for the opposite hypothesis (9 + 8 stimuli). These differences serve as a basis for further accentuation of group differences. Because of these potentially valid interpretations of the available stimuli, McGarty et al. argue that illusory correlation reflects a sense-making process based on real differences in the task which create expectations of intergroup differences. This approach has been variously referred to as the categorization approach (Berndsen et al., 1998), the evaluative differentiation approach (Klauer & Meiser, 2000) and the differentiated meaning approach (Haslam, McGarty & Brown, 1996; McGarty & de la Haye, 1997). In this book we use the last of these terminologies (see also McGarty, this volume; Spears, this volume; Yzerbyt & Rocher, this volume).

Currently it seems unlikely that any one of the models reviewed above can exclusively explain all aspects of this illusory correlation paradigm, and it seems more likely that they all contribute to the explanation of at least some aspects of this effect. In this chapter, we develop the differentiated meaning approach further, and outline a programme of research designed to evaluate and extend this approach. We show how the illusory correlation phenomenon is both produced and influenced by features of the task that impinge on this category differentiation process. Specifically, we first analyse the effects of the task instruction and the nature of the stimuli on the perception of illusory correlation. Thereafter, we focus on the process underlying the formation of illusory correlation, and show *how* illusory correlations are formed.

Task features inducing the perception of illusory correlation

In this section we discuss two features of the illusory correlation task that, in our view, are likely to elicit group differentiation. The first feature involves participants' interpretation of the task instructions. The second feature concerns the form and content of the stimuli. We examine how these features affect the process of categorical differentiation, resulting in the perception of illusory correlations.

The standard instructions

The instructions used by Hamilton and Gifford (1976) informed participants that they would be shown descriptions of behaviour performed by members of two groups, labelled A and B, and that in the real-world Group B is smaller than Group A. This standard instruction includes two related aspects that encourage categorical differentiation: the term 'group' and the labels A and B. In our view both aspects affect the perception of illusory correlation by influencing the tendency to categorically differentiate between the groups. This is because the term 'group' can induce expectations of similarities within a group, whereas the labels A and B can induce expectations of differences between the groups.

Following ideas developed by Grice (1975), researchers have argued that experiments create a conversational context whereby the experimenter communicates information, sometimes unwittingly, to the participants (Bless, Strack & Schwarz, 1993; Gigerenzer, 1991; Grice, 1975; Hilton, 1995; Yzerbyt, Schadrin, Leyens & Rocher, 1994). Participants expect experimenters to follow the conversational rules of being informative, relevant, truthful and unambiguous (Grice, 1975). Although experimenters try to make the information presented in the task informative and meaningful, they often do not provide all information (to do so might reveal the deception necessary to many experiments or introduce demand characteristics). For example, participants are not informed about the purpose of the illusory correlation task. However, if the purpose or meaning of a task is not clear to participants, they need to go 'beyond the information given' in order to make sense of the task.

Yzerbyt, Leyens and Rocher (1997) and Abele and Petzold (1998) also demonstrated that participants try to use all information presented by making sense of both explicit information and subtle cues ('meta-information') in the task. Applying the conversational rules to the illusory correlation task it is possible to argue that this task creates certain expectations, and notably the expectation that there are genuine differences

between the two groups. Based on this, and drawing on the concept of *differentiated meaning* (McGarty & Turner, 1992), McGarty et al. (1993) argued that participants in the illusory correlation paradigm try to make sense of the stimulus situation by attempting to allocate the stimuli to meaningful (i.e., clear and separable) categories. In their view the task in the illusory correlation paradigm evokes expectations such as finding out how Group A and B differ from each other. Participants might even reason to themselves 'presumably there must be differences between the two groups, otherwise why should they have been given different names'. We now turn to research investigating this issue.

Labels A and B: expecting intergroup differences

The previous line of reasoning suggests that undermining the expectation to find meaningful differences between the groups should eliminate the illusory correlation effect. This prediction was supported by Haslam, McGarty and Brown (1996) and Berndsen, Spears, van der Pligt and McGarty (1999). Haslam et al. (1996) showed that the illusory correlation effect disappears when the stimulus groups are labelled as right- and left-handed persons rather than as Group A and B, suggesting that it is less meaningful to categorize right- and left-handed people in evaluatively different groups, or at least to distinguish these in terms of good or bad people (at least not since the middle ages).

However, it is possible that the study of Haslam et al. (1996) did not deal with 'raw' stereotype formation as is the case in the standard illusory correlation task, because of the general shared knowledge that there are no evaluative differences between left- and right-handed people. Thus the attenuated illusory correlation effects might be due to the knowledge or pre-existing stereotype about well-known groups (even perhaps an expectation-based illusory correlation based on the knowledge of no difference). Therefore, we (Berndsen et al., 1999, see also Yzerbyt & Rocher, this volume, who describe related research by Yzerbyt, Rocher, McGarty & Haslam, 1999) used other stimulus groups, namely students from previous study years (1993, 1994) as the basis for the group categorization. We argued that participants *expect* that these student groups will probably not differ from each other rather than already knowing this. Therefore these stimulus groups may provide a better test of the process of stereotype formation than was the case for Haslam et al. (1996).

As predicted, respondents indicated that they expected fewer differences between student groups than between stimulus groups A and B. Moreover, the illusory correlation effect was obtained for the Group A vs. B condition but disappeared in the condition with student groups.

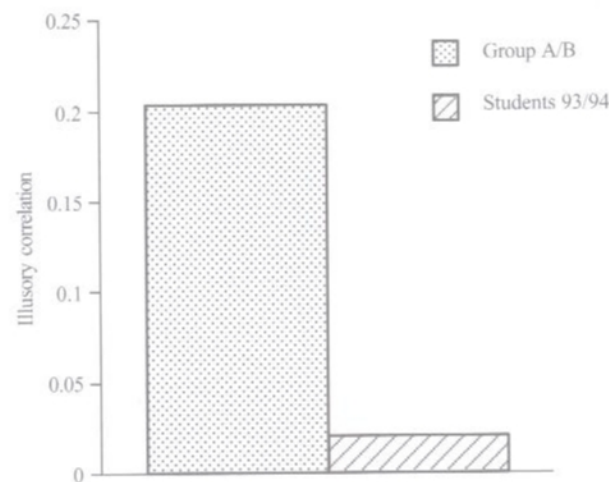


Figure 5.1 Illusory correlation as a function of expectation.
 Note: Adapted from Berndsen et al. (1999), p. 208.

These effects are displayed in Figure 5.1. Thus, the labels A and B seem to induce expectations about intergroup differences. Ironically, the labels A and B were originally used to eliminate expectations associated with real groups that might otherwise explain illusory correlations (see e.g., Hamilton & Rose, 1980). However, our research shows that labelling the groups A and B does nothing to undermine the suspicion that the groups should differ from each other, and can actually reinforce this. We now consider the impact of the term 'group' on the perception of illusory correlation.

Groups: expecting intragroup similarities

It seems reasonable to assume that expectations involving differences between the groups also include the expectation that members belonging to a particular group are expected to display similar behaviours, because the term 'group' suggests that individuals who belong to it share behaviours, outlooks, or attitudes, at least to some degree. Following the categorization approach, strengthening the expectation of group coherence should therefore enhance the perception of illusory correlation compared to the case where less coherent groups are expected. This prediction is in contrast with that of Hamilton and Sherman (1996) who argued that perceiving a coherent group evokes on-line processing, which is assumed to eliminate illusory correlations derived from paired distinctiveness. We manipulated the degree of coherence by informing participants either

that group members shared the opinions and attitudes belonging to their group, or that group members strongly differed in their opinions and attitudes. The results supported our prediction showing that when participants expected group coherence illusory correlation was higher (Berndsen, Spears, McGarty & van der Pligt, 1998).

We have also attempted to undermine expectations of intragroup similarities by manipulating the standard instructions in another way. Participants were either provided with the standard instructions or were provided with an instruction in which their attention would be drawn to differences in behaviour *within* each group. The idea was that they should thereby be less likely to perceive the groups as homogeneous, attenuating the illusory correlation effect. As expected, focusing on within-group differences eliminated the illusory correlation effect, whereas the effect was obtained with the standard instructions (Berndsen et al., 1999; see also Yzerbyt & Rocher, this volume). Thus the instructions used in the standard task seem to encourage a focus on intergroup differences, and group differentiation, although participants are not explicitly asked to do this.

To summarize, we argue that illusory correlation depends on expectations involving intragroup coherence and intergroup differences. When such expectations are undermined the illusory correlation effect does not emerge. This then suggests that general expectations involving similarities within and differences between groups play an important role in data-based as well as expectation-based illusory correlations. Perceived group coherence can also be influenced by the nature of the stimuli presented to participants. Next, we examine how stimulus features affect the process of categorical differentiation.

The nature of the stimuli

We now discuss two aspects of the stimulus information that can facilitate categorization and thus illusory correlation. Firstly, we discuss whether the content of the stimuli contributes to categorical differentiation. Secondly, we discuss the possibility that the nature of the skewed frequency distributions of the stimuli presented in the illusory correlation task can enhance the tendency to categorically differentiate between the groups.

Stimulus content Earlier we saw that individuals belonging to the same group are expected to display coherent behaviour, which is in line with the differentiated meaning approach. Following this approach, perceived group coherence is considered an important ingredient in illusory correlation. We (Berndsen et al., 1998) tested the effect of group coherence in terms of the stimulus data by manipulating the content of the

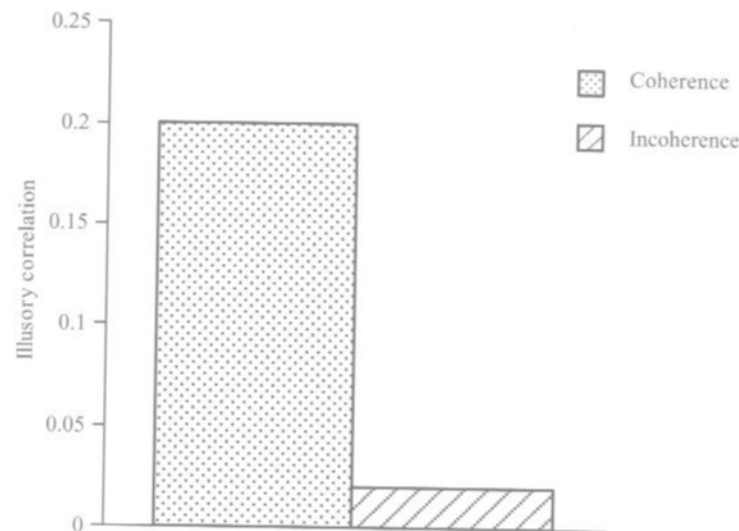


Figure 5.2 Illusory correlation as a function of data-based coherence.
 Note: Adapted from Berndsen et al. (1998), p. 1455.

stimuli. In one condition the stimuli referred to extreme behavioural acts (based on pretesting), that is, behaviours that were either extremely positive or negative. In the other condition the behaviours were moderately positive and negative. The idea was that evaluatively extreme behaviours should undermine the ability to perceive the groups as homogeneous or coherent. This should then attenuate the illusory correlation effect, compared to the condition in which participants were presented with sets of evaluatively moderate behaviours. The results are displayed in Figure 5.2.

These results supported the differentiated meaning prediction that the emergence of illusory correlation depends on group coherence. Specifically the effect should be higher where there is high behavioural similarity within the groups. This pattern is, however, inconsistent with the paired distinctiveness explanation (Hamilton & Gifford, 1976) and also the modified version of this by McConnell et al. (1994a). According to this view the extreme behaviour conditions should if anything render the most distinctive cell even more distinctive and accessible to memory according to the availability heuristic. Thus, the occurrence of the illusory correlation effect seems to be constrained by a certain level of similarity or coherence within the sets of behaviours describing a group. If within-group differences are so extreme that they imply that within-group differences are greater than between-group differences, meaningful

categorization is undermined, explaining the elimination of the illusory correlation effect.

Another important aspect of stimulus content involves the behavioural domain. Does illusory correlation occur with domains other than social (un)desirable behaviours? Berndsen, Van der Pligt and Spears (1994) found that the effect did not always emerge for behaviours that varied in terms of risk. Risk behaviours can be distinguished on an evaluative dimension (positive versus negative) and on a descriptive dimension (riskiness). For example, evaluatively opposite but descriptively similar risk-related terms are 'careful' vs. 'overcautious'. Both refer to risk-avoiding behaviour, but careful behaviour is evaluated more positively than overcautious behaviour. Descriptively opposite but evaluatively consistent terms are 'careful' and 'adventurous'. Both terms have a positive connotation, but 'careful' refers to risk-avoiding behaviours while 'adventurous' refers to risk-seeking behaviours. Results of this study revealed illusory correlations when the behaviours were evaluatively different, but not when they were descriptively different.

One interpretation of these results is that illusory correlation is more likely to occur for behaviours that vary on an evaluative dimension. McGarty et al.'s (1993) results showed the importance of the evaluative dimension in distinguishing between the groups and research by Klauer and colleagues also points to the importance of evaluative differentiation in producing the illusory correlation effect (Klauer & Meiser, 2000; Klauer et al., 2001; see also Spears, this volume). Although the evaluative dimension seems to be extremely important for the generation of illusory correlation, the research just described also points to clear restrictions: if the evaluations within the groups are extremely positive and negative, group coherence is undermined.

Another plausible interpretation for the attenuated illusory correlations when the behaviours are descriptively different can also be sought in the concept of coherence. It is possible that for some groups and some dimensions, descriptive inconsistency is more likely to undermine coherent group impressions than evaluative inconsistency. That is, it seems harder to reconcile descriptively opposite behaviours within a group – for example reckless and overcautious gamblers, or careful and adventurous nurses – than evaluatively inconsistent behaviours (e.g., reckless and adventurous gamblers or overcautious and careful nurses). If so, this could also explain the reduced illusory correlation effect for groups comprising descriptively opposite tendencies. Ironically, then, although the evaluative dimension may be very powerful, it may be more open to variation than the descriptive dimension (even serial killers may be nice some of the time).

Skewed frequency distributions We now discuss the impact of the skewness of stimulus distributions on illusory correlation. According to our approach, illusory correlation arises primarily as a product of meaningful categorical differentiation rather than of paired-distinctive stimuli. McGarty et al. (1993) demonstrated that the perception of paired-distinctive stimuli is not necessary to obtain illusory correlations. They constrained the stimulus series without introducing distinctiveness and still found illusory correlation effects. We tested the effects of another way of constraining the stimulus situation on the occurrence of illusory correlation (Berndsen et al., 2001). Specifically, participants were presented with either stimuli describing only one stimulus group (Group A) performing positive (24) and negative (12) behaviours, or with stimuli describing only positive behaviours performed by the two groups (24 Group A and 12 Group B). We predicted and found illusory correlations in both constrained conditions. Thus perceiving statements that are skewed on one dimension (group or behaviour), or providing general information about two groups and a comparative dimension of evaluation (as in the work of McGarty et al., 1993), seem sufficient for the occurrence of illusory correlation without any paired distinctiveness.

This raises the question whether paired distinctiveness is confounded with factors that are likely to facilitate the illusory correlation effect. We (Berndsen et al., 1998) found that not all levels of paired distinctiveness lead to the perception of illusory correlation. Put differently, particular levels of skewness in the distribution enhance the perception of group coherence and hence the perception of illusory correlation. In Study 1 (described above) we demonstrated that perceptions of non-coherent behaviours eliminated the illusory correlation effect as opposed to perceiving moderately coherent sets of behaviours. But what would happen if the groups were perceived as extremely coherent? Following the differentiated meaning explanation, accentuating differences between very coherent groups might be too difficult (if the groups are very similar to each other) or not meaningful (if the groups are very different from each other). Following this reasoning, judgements of extremely coherent groups should reduce the perception of illusory correlation. This implies that the relation between coherence and illusory correlation is curvilinear: illusory correlations would occur when groups are perceived as moderately coherent, but not when they are seen as non-coherent or strongly coherent. We (Berndsen et al., 1998) tested this prediction by varying the within-group behaviour distributions while holding the differential group sizes constant as shown in Table 5.2.

Results supported the prediction that illusory correlations were eliminated for very coherent as well as for non-coherent groups but were

Table 5.2. *Distribution of the presented positive and negative stimuli (Berndsen et al., 1998)*

	Noncoherence		Moderate coherence		Strong coherence	
	positive	negative	positive	negative	positive	negative
Group A	14	12	18	8	22	4
Group B	7	6	9	4	11	2

reliable (and reliably higher) for moderate levels of coherence. The latter condition is similar to the standard distribution of Hamilton and Gifford (1976, Study 1). Thus, level of coherence in the stimulus distribution is related to the illusory correlation effect. Moreover, there was no support for the paired-distinctiveness prediction that illusory correlation should be higher in the strong coherence condition compared to the other conditions, due to the greater distinctiveness of the cell with the negative behaviours performed by Group B. In sum, it seems that it is not distinctiveness per se, but data-based coherence (created by the stimulus content and/or by the stimulus distribution) that facilitates the perception of illusory correlation. This is once again difficult to explain in terms of either the paired distinctiveness explanation (Hamilton & Gifford, 1976) or the modified version of this account (McConnell et al., 1994a). In the next section we discuss how data-based coherence could be reinforced and whether particular task features contribute to this process.

Hypothesis testing and differentiated meaning

Thus far we have considered the effects of inputs (data and expectations) that serve as a basis for the perception of intergroup differences and intragroup similarities that feed differentiated meaning. We now consider how this is further accentuated through judgements of the behaviours attributed to the stimulus groups. We argue that the stimuli are not perceived as fixed data, but are continuously reinterpreted in order to facilitate categorical differentiation (much in the way that McConnell et al., 1994a, argue that stimuli are continuously reinterpreted to assess their distinctiveness). Firstly, we discuss how particular features of the illusory correlation task contribute to these reinterpretative processes. Secondly, we provide detailed analyses of the whole process of categorical differentiation including hypothesis testing and reinterpretations, which can result in the illusory correlation effect.

Accentuation and task features

We examined whether features of the illusory correlation task mentioned above facilitated reinterpretive processes. Asch (1952) has noted that perceived meaning is not fixed but interpreted in context. Previous research (Berndsen, van der Pligt, Spears & McGarty, 1996; Berndsen et al., 2001, Study 1) showed that reinterpretive processes play an important role in the perception of illusory correlation. We used a rating task in which participants were presented with behavioural items ascribed to Group A and B, and were asked to rate these items on a desirability scale. Results show that participants accentuated the evaluations of the behaviours enabling them to distinguish between the groups. For example, supposedly positive behaviours of Group B were interpreted as less positive and negative behaviours of Group A as less negative, after perceiving the stimulus set. We argue that these reinterpretations allow participants to differentiate meaningfully between the stimulus groups such that Group B was associated with negative behaviours and Group A with positive behaviours. In other words, evaluative reinterpretations can help to reinforce perceived intragroup similarity, thereby contributing to the perception of illusory correlation. This result challenges the conventional assumption that illusory correlation is based on the detection or storage of stable stimulus information. On the contrary, perceptions of the differences between groups vary dynamically with the process of categorical differentiation. Next, we discuss whether particular features of the illusory correlation task can elicit reinterpretive processes.

Standard instructions and stimulus content

We (Berndsen et al., 1998) investigated whether the standard instruction of the illusory correlation task can lead to a tendency to reinterpret behaviours by manipulating the scope for reinterpretation. In one condition the scope for reinterpretation was constrained by providing the information that two thirds of the behaviours were positive and one third negative, reflecting the real distribution of the presented stimuli. In the other condition the scope for reinterpretation was not so constrained by omitting this information (as is the case in the standard procedure). Our prediction that the constrained scope would result in less reinterpretation than the standard condition (where there was scope for reinterpretations) was supported. Moreover, the constrained-scope condition resulted in significantly weaker illusory correlations, implying that the standard instruction facilitated illusory correlation by providing the opportunity to reinterpret the behaviours (see Figure 5.3).

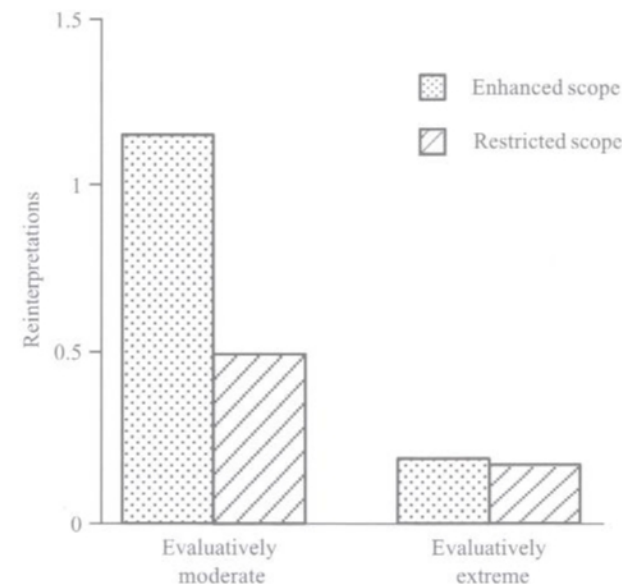


Figure 5.3 Reinterpretations as a function of scope for reinterpretation and evaluative behavioural dimension.

Note: Adapted from Berndsen et al. (1998), p. 1455.

Another feature of the illusory correlation task that affects the degree of reinterpretation is the *content* of the stimuli. We (Berndsen et al., 1998) presented participants with behavioural sets containing either extremely positive and negative behaviours, or moderately positive and negative behaviours for both stimulus groups. The evaluatively moderate behaviours were similar to those used in the standard illusory correlation task. We predicted more reinterpretations for moderately positive and negative behaviours than for extreme behaviours because the extremity of behaviours in itself is expected to limit the range for reinterpretation. Figure 5.3 shows that this prediction was supported, indicating that the standard stimuli allow reinterpretations of behaviours. In sum, both the instruction and the content of the stimuli used in the standard task open the way to reinterpretive processes, offering an additional explanation for the illusory correlation effect.

In previous work (Berndsen & colleagues, 1996, 1998) we demonstrated that these reinterpretations occur in the early stages of perceiving the stimuli. This suggests that respondents seem to develop the idea, or hypothesis, that Group A is more positive than Group B, and are likely to reinterpret the behaviours in line with this developing hypothesis as was

revealed by the clear illusory correlation effects in the second half of the rating task. In another study (Berndsen et al., 2001, Study 2), we used a think-aloud task, in order to assess the whole process of meaningful categorical differentiation; we now turn to this research.

A dynamic process

By using the think-aloud technique, we obtained process-tracing data involving the formation of illusory correlation in the standard task (Berndsen et al., 2001, Study 2). We used the standard task because we have shown that it includes a number of factors that affect (and facilitate) the degree of illusory correlation. To recap, these factors are: expectations of intragroup similarities and intergroup differences, the perception of data-based coherence, and reinterpretive processes. Results supported the categorization approach by showing that most participants started to make sense of the task situation by expressing a general search involving either the meaning of the task (e.g., 'What am I supposed to do? I think I've got to remember which behaviour belongs to which group...'), or the general relation between groups and behaviours (e.g., 'I'm sure that there is a sort of system in this...'). This implies that the formation of illusory correlation started during the perception of statements, and not only when completing the various response measures. After a while most respondents had the impression that Group A was better than Group B, which was subsequently tested against the remaining statements. This reveals that the formation of illusory correlation resembles *hypothesis testing* behaviour, in which a particular hypothesis is tested against data that can confirm or disconfirm the hypothesis. This process is clearly in line with the original arguments developed by McGarty et al. (1993).

Berndsen et al.'s study revealed that illusory correlation depends on a search for differentiation and in particular on the *strategy used to test* the differences between the groups. Participants who reported no illusory correlations, started with the same hypothesis (i.e., the positivity of Group A over Group B) as participants who displayed illusory correlations. The only difference between them was the test strategy; the former group of participants focused on disconfirmations, resulting in attenuated illusory correlations, whereas the latter group searched for confirmations. Thus the absence of illusory correlation seems here not to result from 'accurate' perception, as is generally assumed, but from a different test strategy.

It was also interesting to see that being attentive to disconfirming evidence did more than simply reduce the perception of illusory correlation. We found that many respondents reinterpreted the disconfirming

behaviours (the negative Group A or the positive Group B behaviours) in line with their original impression or hypothesis. This behaviour is consistent with the idea of the 'motivated tactician' (Fiske & Taylor, 1991), who selects information-processing strategies on the basis of goals, motives and needs. In line with this view, Kunda (1990) has also suggested that people often use evidence in ways that make their inferences come out in desirable ways for them.

The following example from our research illustrates this behaviour. The (supposedly negative) statement 'A member of Group A often does not finish things he/she just started work on', was interpreted positively by saying 'that must be a very dynamic person, the people belonging to Group A are spontaneous and interested in so many things'. Such reinterpretations serve to reinforce the hypothesis that Group A is better than Group B, and complement a confirmatory hypothesis testing strategy. Thus reinterpretations strengthen the illusory correlation effect which in turn encourages the reinterpretation of subsequent behaviours. Taken together, the data confirm that the formation of illusory correlation reflects a dynamic process in which the perception of illusory correlation and reinterpretations of behaviours are mutually reinforcing.

Conclusions

Following the differentiated meaning approach, we argued that illusory correlation can arise as a product of imposing sense on the stimulus situation. In line with this approach, we have argued and demonstrated that there are two important determinants of illusory correlation: (a) cues that elicit expectations of intragroup similarities and intergroup differences, and (b) the perception of coherent behaviours. In Figure 5.4 we present these factors and their relation to illusory correlation.

In this chapter we described empirical evidence providing support for the various links presented in Figure 5.4. Haslam et al. (1996) and Berndsen et al. (1999) showed that the illusory correlation effect does not emerge in the absence of expectations involving intergroup differences. Similarly, when expectations of group coherence are reduced, the illusory correlation effect is eliminated (Berndsen et al., 1998, 1999; Yzerbyt & Rocher, this volume). On the other hand, if these general expectations are present but the behaviours are perceived as non-coherent due to the stimulus content or the distribution of the stimuli, the effect also disappears (Berndsen et al., 1994, 1998).

We have also shown that these two determinants (expectations and perceiving coherent behaviours) operate in the standard illusory correlation

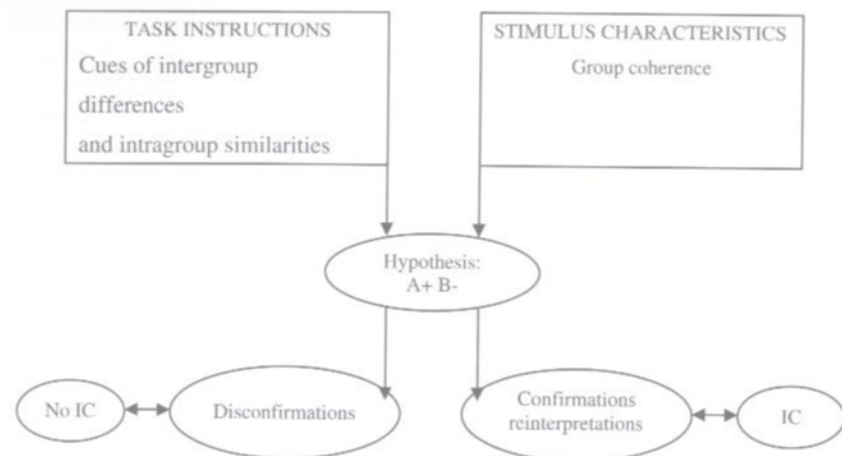


Figure 5.4 Factors affecting illusory correlation. Rectangles refer to antecedent conditions and ovals to dependent variables. The two-sided arrows indicate that (dis)confirmations/reinterpretations and illusory correlation influence each other.

task. More specifically, general expectations are created through the standard instructions, and both the skewed distribution and the content of the stimuli inform perceivers as to the coherence within the groups. Furthermore, the standard illusory correlation task seems to elicit reinterpretive processes because both the instructions and the stimulus content provide scope for reinterpretation. Thus participants make sense of the situation by actively reinterpreting their evaluations of the stimuli so that they become categorically meaningful. This reinterpretive process represents an additional mechanism leading to the occurrence of illusory correlation.

An important contribution of our research programme is that it shows that expectations play an important role in the formation of illusory correlation. This calls into question the viability of making a neat distinction between data-based and expectation-based illusory correlation at all. These two types of illusory correlation are usually treated separately because expectation-based illusory correlations are considered as explanations for maintaining stereotypes about socially meaningful groups (e.g., Hamilton & Rose, 1980) whereas data-based illusory correlations are seen as explanations for the formation of stereotypes (as discussed here). Based on the research in this chapter, we argue that these two types of illusory correlation are not as distinct or diametrically opposed as is often assumed, and have in common that they both deal with expectations of differences and similarities. Indeed these ideas have been

used by McGarty (1999, this volume) as part of the platform for the development of the constraint relations formulation treatment of categorization in general and of stereotype formation in particular.

Another contribution of our research is that we are able to answer the three questions raised at the very beginning of this chapter. On what basis do we form relations between social stimuli such as group membership and behaviour? Our research reveals a number of important features involved in the formation of illusory correlation. In line with the differentiated meaning approach, we consider illusory correlation and its development as a sense-making process involving the search for differences between groups, which is reflected by hypothesis testing occurring in the initial phase of the illusory correlation task. Any disconfirmation of the hypothesis that Group A is better than Group B, is reinterpreted in such a way that it confirms the original hypothesis and simultaneously increases the coherence within the groups. This active process of forming coherent impressions of groups reveals that intragroup similarity is a precursor (expectations and stimuli) as well as a product (reinterpretations) of differentiation and illusory correlation. In other words, the formation of categories reflects the mutually reinforcing nature of similarity over time.

This active sense-making process also provides an answer to the question of whether people find it easy to detect relations between groups and their behaviours. Most explanations of illusory correlation suggest that we do not spend much energy on perceiving relations by emphasizing the automatic aspects of information processing due to enhanced or impaired memory. However, our view is exactly the opposite: we have shown that perceivers expend considerable effort to understand the meaning of the task and the nature of the groups and not just when they are subsequently asked to recall the information or form impressions.

The final question we raised in this chapter was whether our perception of group relations is biased. Put differently, how does a sense-making process of differentiation in the illusory correlation paradigm relate to the process of stereotyping social groups? The dominant view of stereotypes is that they are erroneous generalizations based on illusory perceptions that result from cognitive limitations (see e.g., Fiske & Neuberg, 1990; Hamilton, 1981a). This suggests that 'accurate' perception should result in the absence of illusory correlation. However, the research reported in this chapter suggests something quite different, namely that the absence of illusory correlation is a consequence of a different test strategy. Focusing on any disconfirmations of the hypothesis involving the positivity of Group A over Group B, eliminated the illusory correlation effect in contrast to a focus on confirmation. Thus both the perception of illusory

correlation and its absence can arise from the same functional sense-making process.

Extending this idea to the area of stereotypes, this implies that stereotypes are not necessarily distortions but rather reflect detection of important features of the perceiver's social world. We should not forget either that even the experts disagree about whether the actual stimuli contained in this paradigm contain evidence justifying the conclusion that these stereotypes are based on genuine group differences (see also McGarty, this volume; van Knippenberg & Spears, in press; Spears, this volume). As is often the case, the participants in our studies may be more rational than previously thought. If there is bias this may be as much a product of the tools and concepts researchers have used to understand our participants behaviour, as of the tools and concepts participants have used to understand our paradigms.